DOCUMENT RESUME

ED 347 788 FL 019 043

AUTHOR Al-Omoush, Ahmad
TITLE Has Abstractness Been Resolved?
PUB DATE 89
NOTE 11p.
PUB TYPE Journal Articles (080)
JOURNAL CIT Dirasat; v16 n11 p68-77 1989

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Abstract Reasoning; Foreign Countries; *Generalization; *Generative Phonology; Language Research; *Phonology; Structural Analysis (Linguistics); Uncommonly Taught Languages
IDENTIFIERS *Natural Language

ABSTRACT

A discussion focusing on the abstractness of analysis in phonology, debated since the 1960s, describes the issue, reviews the literature on the subject, cites specific natural language examples, and examines the extent to which the issue has been resolved. An underlying representation is said to be abstract if it is different from the derived one, but as the underlying representation deviates from the corresponding phonetic representation, rules required to cover the deviating phonetic forms increase. Postulating abstract representations is pointless unless they are well-motivated and have a simplifying effect on grammar. Phonological theory must impose some constraints on underlying representations so unmotivated analyses can be excluded. However, some proposed constraints prohibit certain analyses that are well-motivated on internal grounds. It is argued that the problem of abstractness is unresolved without sufficient external evidence that touches on the validity of internal evidence. Examples are presented that provide evidence for abstract analysis, including: a study of a Polish vocalic phonology; an analysis of vowel harmony in Manchu, a Uralic-Altaic language; and vowel harmony in Yawelmani. The last is a case in which the need for resorting to abstract analysis arises because significant linguistic generalizations can be achieved only by such means. (MSE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Dirasat Volume 16 (1989) Number 11

ED347788

Has Abstractness Been Resolved?[1]

Received on 26/2/1989 Accepted for Publication on 5/9/1989

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Ahmad Al-Omoush*
University of Jordan

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
A. Al-Omoush
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ملخص

يحاول هذا البحث ان يجيب و بشكل اساسي عما اذا حلت مسألة التحليل التجريدي في علم الفونيمات. وكجزء من الاجابة على هذا السؤال يطرح البحث العديد من الاسئلة كمدخل لتناول الموضوع من شتى جوانبه. ومن المفيد ان نشير الى ان مسألة التحليل التجريدي في علم الفونيمات كانت وما زالت موضع جدل كبير منذ صدور كتاب ناحوم جومسكي (الانماط الصوتية للغة الانجليزية) في عام ١٩٦٨. و يشكل هذا البحث مساهمة جادة في النقاش الجاري حول هذه القضية عن طريق التعرض للدراسات المتعلقة بهذا النوع من التحليل الفونيمي. وستختتم الدراسة باعطاء مثال يثبت جدوى وضرورة اللجوء الى التحليل التجريدي (التجريدية) في التحليل الفونيمي للغات.

Abstract

The issue of "abstractness" of analysis in phonology has been debated since the appearance of SPE. This study attempts to find out to what extent this issue has been resolved. The paper starts by stating precisely what is at issue. It cites relevant literature that has focused on abstractness in phonological analysis. It also uses specific natural language examples. The paper ends by giving an example that shows the necessity for resorting to abstract analysis in such cases where significant linguistic generalizations can only be achieved via such means.

0. Abstractness is one of the most important issues to have dominated phonological theory ever since the appearance in 1968 of the monumental

---

1 For helpful and encouraging comments on an earlier draft of this paper, I am indebted to John Goldsmith and Linda Schwartz.

* Assistant Professor (Syntax), Department of English, Faculty of Arts, University of Jordan, Ph.D., Indiana University, U.S.A., 1984.

BEST COPY AVAILABLE

FL019043

work of Chomsky and Halle, *The Sound Pattern of English*. The problem of abstractness was launched with particular clarity by Kiparsky's (1968 a) paper "How Abstract is Phonology?," by the response it evoked (Kisseberth (1969); Hyman (1970), Brame (1977); Vago (1973); Jensen (1974)), and by Kiparsky's subsequent revision of his earlier position (Kiparsky, (1971); (1973)). These studies, among others, caused a polarization of opinions leading to radically different approaches to phonology, depending on the accepted degree of phonological abstractness. On the one hand, there are those linguists who believe in the necessity of recognizing relatively abstract representations, e.g., Brame (1972 a); Lightner (1972, 1978); Vago (1973); Andersen (1974); Halle (1977); Kenstowics and Kisseberth (1977), and, on the other hand, there are those who wish to impose far-reaching restrictions on admissible abstractness, e.g., Hooper (1976; 1977), Venneman (1974 a, b) to mention but a few. In the following pages the discussion will touch upon the major issues involved in the question of abstractness.

1. Plato and Aristotle used to tell their students that the best way to learn is to ask questions. During the course of this paper the following questions will be addressed:

1) What makes an underlying representation 'abstract'? What evidence can be adduced in support of abstract representations?

2) Why is abstractness a controversial issue?

3) Are there degrees of abstractness?

Later in the discussion a separate section on the analysis of the Yawelmani Vowel System will be presented as striking evidence for abstract analysis.

An underlying representation is said to be abstract if it is different from the derived one. Yet this difference is not without cost. Each time an underlying representation deviates from the corresponding phonetic representation (PR), rules are required to recover the phonetic form, and, of course as the UR increases in the degree of abstractness (abstract, less abstract, more abstract, most abstract, etc.), the number of phonological rules increases. Consequently, there is little point in postulating abstract representations unless they are well-motivated and have a simplifying effect on grammar.

Perhaps the most important simplifying effect is that in which morphemes show alternation where there is a proliferation of variations on the surface. The lexicon will be simplified whenever a morpheme can have a single representation. Furthermore, rules accounting for the various

alternants should not simply be devices for generating the appropriate derived forms but rather to point to significant processes operating in the language. That is to say rules should tell us how the language works (i.e., the internalized grammar of the native speakers of the language).

In Kiparsky's view, each language has an inventory of segments (phonemes) appearing in the URs. The UR of a morpheme may not contain a phoneme /X/ that is always realized phonetically as identical to the realization of some other phoneme /Y/. This view of Kiparsky's, (as espoused in 1968(a)) known as the Alternation Condition, has two sides. The strong side of this condition (which prevents absolute neutralization and some cases of contextual neutralization universally) is too strong, because it excludes a considerable number of well-motivated analyses. In its weak form, the alternation condition allows abstract URs if there is enough evidence to motivate such representations. It does not provide the kinds of relevant evidence or the quantity of evidence that is needed to reject or accept any given abstract analysis.

On the other hand, abstract representations can also have an explanatory function. What on the surface may appear to be an anomaly often has an explanation at the abstract level. For example, in the analysis of Yawelmani (Kenstowics and Kisseberth (1977[2])), the underlying long high vowels explain the peculiar surface manifestations of suffix vowels and of vowels of bisyllabic verb stems. In French, all plural adjectives have the same structure in their underlying representations — they all contain the plural marker /Z/ even though this marker does not always show up on the surface.

Kiparsky's paper alluded to earlier had an enormous influence on subsequent work on phonology. It appeared immediately after *SPE*, in which a fairly consistent following of the generality — simplicity criterion had led to the positing of many underlying representations which were remarkably 'abstract', with the differences being related only very indirectly to surface alternations. Indeed the underlying form of one morpheme was often justified by alternations observed in quite different morphemes, for example[3]:

---

2. For a detailed analysis of Yawelmani, see Michael Kenstowics and Charles Kisseberth, *Topics in Phonological Theory* (New York: Academic Press, 1977), 34ff.

3. These examples are adopted from A. Sommerstein, *Modern Phonology* (London: E. Arnold, 1977).

Underlying	Surface	Gloss
rixt	rājt	' right '
rīt	rājt	' rite '
lād	lɔ̄əd	' laud '
mūdlin	mɔ̄ədlIn	' maudlin '
mūntVn	māwntən	' mountain '
long	lɔ̄əŋ	' long '
kɔ̄en	kɔ̄jn	' coin '

Underlying -surface pairings like these exhibited one or more of a number of characteristics which to Kiparsky, and to many since, appeared to be objectionable.

It is clear enough that some restrictions are required to limit the power of the simplicity-generality criterion. It is therefore necessary to determine what these restrictions are and what evidence is admissible for determining their nature.

The importance of the latter is evidently found in the attempt of Hyman (1970) to use loan-word phonology as evidence in favour of a relatively abstract analysis. Hyman's argument goes like this: (his argument is based on data from Nupe[4])

> Problem: whether, in a given language, to derive in some or all instances of surface [Y] from underlying / X /.
>
> Evidence: in nativization of loan-words from other languages, speakers of the language under investigation regularly replace [X] of the source language by their own [Y].
>
> Inference: these speakers have a rule X → Y (or as a sequence of rules with the same effect) as part of their linguistic competence.
>
> Conclusion: the abstract analysis is justified.

Vago (1973) argues that what is really needed, is to establish a theory which can properly evaluate competing analyses by carefully examining the kinds of rules and predictions which each analysis employs. His basic arguments against Kiparsky's claims amount to the idea that the abstract analysis is to be preferred over the rule-feature solution on theoretical grounds.

4. See Larry Hyman, "The Role of Borrowing in the Justification of Phonological Grammars," *Studies in African Linguistics*, 1, 1970, 1-48.

A much more radical approach to the question of abstractness was put forward by Hooper (1976) who proposes imposing what she calls the "True Generalization Condition" (TGC) on phonological rules. This condition requires

> that all rules express transparent surface generalizations, generalizations that are true for all surface forms and that, furthermore, express the relation between surface forms in the most direct manner possible ... . The True Generalization Condition claims that the rules speakers formulate are based directly on surface forms and that these rules relate one surface form to another, rather than relating underlying to surface form.[5]

The TGC thus requires that all phonological rules be defined to operate on the phonetic representation. Hooper claims, and I agree with her, that there are two other issues that go along with the question of underlying forms. These concern phonological rules and alternations. In Hooper's words:

> There are two other issues that must be settled along with the problem of underlying forms. One of these is the question of what is a linguistic rule and what sort of empirical criteria may be applied to the matter of deciding what is and what is not a rule: the other concerns the nature of alternations and the question of what sort of a relation between forms constitutes an alternation.[6]

While all generative phonologists seem to agree that underlying representations of the phonological form of a morpheme should be specified in features that have intrinsic phonetic context, there is nothing explicit in the theory that specifies just how different underlying forms may be from surface forms. In a very abstract analysis, underlying forms may be quite different from surface phonetic forms; in a concrete analysis, underlying forms will be very similar if not identical to surface forms.

In order to find some middle ground between these two kinds of analyses and those in between, a number of constraints have been proposed, some of which we have already touched upon, to limit abstractness. However, as has been shown earlier in the discussion, the abstract analysis controversy involves more than the abstractness of underlying representations.

---

5. Joan Hopper, *An Introduction to Natural Generative Phonology* (New York: Academic Press, 1976), 13.

6. *Ibid.*, 12.

In conclusion, it is clear that phonological theory must impose some constraints on underlying representations so that unmotivated analyses can be excluded. However, constraints such as Kiparsky's alternation condition, Hooper's TGC, etc ..., prohibit certain analyses that are well-motivated on internal grounds. If such internal evidence is accepted, then such constraints must be rejected as extreme constraints on abstractness. However, it seems to me that the problem of abstractness is far from being resolved until some sufficient external evidence that touches upon the validity of internal evidence is brought up. As such, the problem of abstractness remains one of the most important issues facing contemporary generative phonology.

2. The Evidence for the Abstract Analysis

Before going to the Yawelmani analysis, I would like to draw attention to two other important examples that also provide evidence for the abstract analysis. The first of these is Gussman's[7] (1980) study of Polish vocalic phonology. Gussman's study can be regarded as a step in the right direction and a valuable contribution to the ongoing debate of abstractness. Hence his study points out the need for abstract representations and rules which may be contradicted (i.e., made opaque) on the surface.

The second example comes from Vago (1975). Vago provides an abstract analysis of the vowel harmony exhibited in Manchu, an Uralic-Altaic language. Manchu has six vowels: i e a o u ô. For our own purposes, it will be sufficient to cite the following examples to demonstrate our point[8]:

a. ilhi	' order '	ilhi-ngge	' next in order '
b. isi	' attain '	isi-ngga	' sufficient '
c. muji	' will '	muji-ngga	' determined '
d. uksi	' armor '	uksi-ngge	' armored '

These forms have only neutral vowels since their suffixes are not predictable from the surface. Regardless of whether the neutral vowel of these stems is *i* or *u*, both back and front vowels can follow. If we posit /ngge/ as the underlying suffix, the rule-feature solution would work in the case of (d) but not (b). If / ngga / were posited as the underlying suffix, the rule-feature solution would derive (b) but not (d). The rule-feature solution thus fails in both cases. Consequently, Vago concluded that an abstract underlying segment must be posited. This abstract segment will undergo

7. Edmund Gussman, *Studies in Phonology*, *Linguistic Inquiry*, Monograph 4, 1980.

8. For more data and discussion see R. Vago, *Hungarian Generative Phonology* (Bloomington: TULC, 1975), 10-15.

Absolute Neutralization after Vowel Harmony is applied. If the underlying adjectival suffix is / ngge /, then the determining vowel in (b) must be a back vowel. Vago adds that if / ngga / is chosen, then the determining vowel in (d) must be a front vowel. Whichever of these two options is adopted, we will be dealing with an abstract segment.

Turning to Yawelmani it can be seen that its vowel harmony is a classic example of the crucial need for abstract analysis[9]. Yawelmani has the following vowel system:

long vowels	e: a: o:
short vowels	i e a o u

However, of the five short vowels, only four are underlying sounds; the vowel e is a surface variant of the long vowel e:, arising from a vowel shortening rule as is evidenced from the following forms:

I.	ṣa : p -al	'might burn'	ṣap -hin'	' burns '
	do : s -ol	' report '	dos -hin	' reports '
	me : k' -en	' will swallow '	mek'-k'a	' swallow '

Apparently, the surface long vowels of Yawelmani do not pair neatly with the four underlying short vowels. To account for this discrepancy, K & K present evidence purporting to show that the underlying vowel system in Yawelmani is i:, a:, o:, and u:. Furthermore, they argue convincingly that surface e: derives from underlying i:, while surface o: derives from two different underlying vowels, o: and u:. For example:

II.

Nonfuture	Nonfuture Passive	Precative	Dubitative	Gloss
xat-hin	xat-it	xat-xa	xat-al	' eat '
xil-hin	xil-it	xil-xa	xil-al	' tangle '
bok'-hin	bok'-it	bok'-xo	bok'-ol	' find '
dub -hun	dub -ut	dub -xa	dub -al	'lead by hand '
giy'-hin	giy'-it	giy'-xa	giy'-al	' touch '
k'o?-hin	k'o?-it	k'o?-xa	k'o?-ol	' throw '

9. This description is adopted from Michael Kenstowics and Charles Kisseberth, *Topics in Phonological Theory* (New York: Academic Press, 1977), 34ff.

To account for the facts of the data above, K & K propose the following rule of vowel harmony:

$$\begin{bmatrix} V \\ \alpha \text{ high} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{ round} \\ +\text{ back} \end{bmatrix} / \begin{bmatrix} +V \\ \text{round} \\ \alpha \text{ high} \end{bmatrix} Co \text{ ———}$$

This rule states that a vowel becomes round and back if it is preceded by a round vowel of the same height within the word. However, the following set of data creates problems for this rule:

III.

Non-future	Non-passive	Precative	Dubitative	Gloss
ṣap-hin	ṣa:p-it	ṣap-xa	ṣa:p-al	' burn '
mek'-hin	me:k'-it	mek'-xa	me:k'-al	' swallow '
dos-hin	do:s-it	dos-xo	do:s-ol	' report '
c'om-hun	c'o:m-ut	c'om-xa	c'o:m-al	' destroy '

K & K observe that vowel harmony predicts that suffixes containing the vowel i do not change to u after a non-high rounded vowel, while suffixes containing a will change to o. The problematic form, here, is c'o:m-. It can be observed that an i vowel after this root is changed to u, whereas an a vowel is not affected. How can this be explained? K & K argue that c'o:m- behaves as if it contains a high rounded vowel. This can be accounted for if surface o: is allowed to derive from u: and o: . Given a UR like / c'u:m -/, it becomes crucial to incorporate in the grammar a vowel lowering rule that lowers u: to o: . Since u: does not occur in the language, this means that all u: vowels would be lowered presenting thus a case of absolute neutralization. Thus to get the surface forms c'om-hun and c'om-xa, vowel harmony, vowel lowering, and vowel shortening have to be applied respectively, or else wrong derivations would result:

/c'u:m+hin/	/c'u:m+xa/	
c'u:m+hun	————————	Vowel Harmony
c'o:m+hun	c'o:m+xa	Vowel Lowering
c'om+hun	c'om+xa	Vowel Shortening
[c'om hun]	[c'omxa]	PR

Thus it can be seen that vowel harmony presents evidence for deriving some surface o: vowels from underlying u: . Similarly, vowel harmony provides evidence for deriving surface long and short e from underlying i: . The following set of data illustrates this:

IV

?ayy-en	' will pole a boat '	c'o:m-on	' will devour '
?edl-en	' will get hungry '	t'uyt'uy-on	' will shoot repeated '
bok'-en	' will find '	wo?y-on	' will fall asleep '

The future suffix with its two alternants -en, -on display an anomalous behaviour. However K & K propose an insightful solution by postulating an underlying i: vowel that never shows up on the surface. Surface e is derived from e: by a vowel shortening rule that has the following form:

$$\begin{matrix} V \\ [+\text{long}] \end{matrix} \rightarrow \begin{matrix} V \\ [-\text{long}] \end{matrix} \; / \; \underline{\quad} \; C \left\{ \begin{matrix} \# \\ C \end{matrix} \right\}$$

Obviously, if e: is derived from underlying i: then the UR of the future suffix must be / i:n /. The following sample derivation explains this:

/ bok' + i:n /	/ c'u:m + i:n /	
———	c'u:m + u:n	VH
bok' + e:n	/ c'o:m + o:n /	VL
bok' + en:	c'o:m + on:	VS
[bok' en:]	[c'o:m on]	PR

Thus, under an analysis that does not resort to abstractness, it would be next to impossible to provide as neat an account for the facts of Yawelmani as the one offered by K & K. Consequently, the abstract analysis of Yawelmani is an example of the basic and urgent need to appeal to the nonconcrete, i.e., abstract solution.

References

Brame, M., (1972 a) "On the abstractness of phonology: Maltese ʕ" in M. Brame, ed., (1972 b).

Gussman, E., *Studies in Abstract Phonology*. Linguistic Inquiry, Monograph 4, 1980.

Hooper, J., *An Introduction to Natural Generative Phonology*, New York: Academic Press, 1976.

Hyman, L., "The Role of Borrowing in the Justification of Phonological Grammars," *Studies in African Linguistics* 1, 1970, 1-48.

Kenstowics, M. and Charles, K., *Topics in Phonological Theory*, New York: Academic Press, 1977.

Kenstowics, M. and Charles, K., *Generative Phonology*, New York: Academic Press, 1979.

Kiparsky, P., "How Abstract is Phonology?," Bloomington: IULC, 1968a.

Kiparsky, P., "Linguistic Universals and Linguistic Change," In E. Bach and R. Harms (eds.) *Universals in Linguistic Theory*, New York: Holt, 1968b.

Kiparsky, P., "Historical Linguistics," in W. Dingwell (ed.). *A Survey of Linguistic Science*, Linguistic Program, 1971, pp. 577-642.

Kiparsky, P., "Elsewhere in Phonology," in S. Anderson and P. Kiparsky (eds.), *A Festschrift for Morris Halle*, New York: Holt, 1973, pp. 93-106.

Shane, S., "How Abstract is Abstract"?, in A. Bruck, R.A. Fox, and M.W. La Glay, (eds.) *Papers from the Parasession on Natural Phonology*, University of Chicago, Chicago, Illinois, 1974, 297-317.

Sommerstein, A., *Modern Phonology*, London: E. Arnolds, 1977.

Vago, R., "Abstract Vowel Harmony Systems in Uralic, and Altaic Languages," Language 49, 1973, 597-605.

Vago, R., *Hungarian Generative Phonology*, Bloomington: IULC, 1975.

Vennemann, T., "Phonological Concreteness in Natural Generative Grammar," in R.W. Shuy and C.J. Bailey (eds.), *Towards Tomorrow's Linguistics*, Georgetown University Press, Washington, D.C., 1974 a, 202-219.